equation of the curve formed by the perpetual intersection of rays, which, diverging from a luminous point, are reflected by a polished surface of a given curvature. Curves of this description have been denominated caustics; and the method usually employed to discover their polar equations, or the relation between the radius vector of any point of the curve and the tangent at that point, is both long and inelegant, and is considered by the author as involving considerable inaccuracy of reasoning. He proposes, therefore, to substitute a new method of investigation, by taking the polar equation of one of the reflected rays, and differentiating this equation with respect to the arbitrary quantities solely which determine its position, and thus obtaining the polar co-ordinates of the point of intersection of two consecutive lines; and finally, by elimination, the equation of the curve in which all such points are found. He is thus led to results remarkable for their simplicity, elegance, and generality: and he gives particular applications of his method, exemplifying the facility with which it effects the solution of problems extremely difficult of management by the ordinary methods hitherto employed. His method is also applicable to the determination of the equations of the evolutes of curves, and to various other problems of a similar nature.

A paper was also read, entitled, "Discovery of the Metamorphoses in the second Type of the Cirripedes, viz. the *Lepades*, completing the Natural History of these singular Animals, and confirming their affinity with the Crustacea." By J. V. Thompson, Esq., F.L.S., Deputy Inspector General of Hospitals. Communicated by Sir James Macgrigor, Bart., M.D., F.R.S.

The discoveries made by the author of the remarkable metamorphoses which the animals composing the first family of the Cirripedes, or *Balani*, undergo in the progress of their developement, and which he has published in the third number of his Zoological Researches (p. 76), are in the present paper, which is intended as a prize Essay for one of the Royal Medals, followed up by the report of his discovery of similar changes exhibited by three species of two other genera of the second tribe of this family, namely, the *Lepades*. The larvæ of this tribe, like those of the Balani, have the external appearance of bivalve Monoculi, furnished with locomotive organs, in the form of three pairs of members, the most anterior of which are simple and the other bifid. The back of the animal is covered by an ample shield, terminating anteriorly in two extended horns, and posteriorly in a single elongated spinous process. Thus they possess considerable powers of locomotion, which, with the assistance of an organ of vision, enable them to seek their future permanent place of residence. The author is led from his researches to the conclusion that the Cirripedes do not constitute, as modern naturalists have considered them, a distinct class of animals, but that they occupy a place intermediate between the Crustacea decapoda, with which the Balani have a marked affinity, and the Crustacea entomostraca, to which the Lepades are allied; and that they have no natural affinity with the Testaceous Mollusca, as was supposed by Linnæus, and all the older systematic writers on Zoology.